

ISSN 2518-1629 (Online),  
ISSN 2224-5308 (Print)

ҚАЗАҚСТАН РЕСПУБЛИКАСЫ  
ҰЛТТЫҚ ҒЫЛЫМ АКАДЕМИЯСЫНЫҢ  
Өсімдіктердің биологиясы және биотехнологиясы институтының

# Х А Б А Р Л А Р Ы

---

---

## ИЗВЕСТИЯ

НАЦИОНАЛЬНОЙ АКАДЕМИИ НАУК  
РЕСПУБЛИКИ КАЗАХСТАН  
Института биологии и биотехнологии растений

## NEWS

OF THE NATIONAL ACADEMY OF SCIENCES  
OF THE REPUBLIC OF KAZAKHSTAN  
of the Institute of Plant Biology and Biotechnology

**БИОЛОГИЯ ЖӘНЕ МЕДИЦИНА  
СЕРИЯСЫ**



**СЕРИЯ**

**БИОЛОГИЧЕСКАЯ И МЕДИЦИНСКАЯ**



**SERIES**

**OF BIOLOGICAL AND MEDICAL**

**1 (319)**

**ҚАҢТАР – АҚПАН 2017 ж.  
ЯНВАРЬ – ФЕВРАЛЬ 2017 г.  
JANUARY – FEBRUARY 2017**

**1963 ЖЫЛДЫҢ ҚАҢТАР АЙЫНАН ШЫҒА БАСТАҒАН  
ИЗДАЕТСЯ С ЯНВАРЯ 1963 ГОДА  
PUBLISHED SINCE JANUARY 1963**

**ЖЫЛЫНА 6 РЕТ ШЫҒАДЫ  
ВЫХОДИТ 6 РАЗ В ГОД  
PUBLISHED 6 TIMES A YEAR**

**АЛМАТЫ, ҚР ҰҒА  
АЛМАТЫ, НАН РК  
ALMATY, NAS RK**

Б а с р е д а к т о р

ҚР ҰҒА академигі, м. ғ. д., проф.

**Ж. А. Арзықұлов**

**Абжанов Архат** проф. (Бостон, АҚШ),  
**Абелев С.К.** проф. (Мәскеу, Ресей),  
**Айтқожина Н.А.** проф., академик (Қазақстан)  
**Акшулаков С.К.** проф., корр.-мүшесі (Қазақстан)  
**Алшынбаев М.К.** проф., корр.-мүшесі (Қазақстан)  
**Березин В.Э.**, проф., корр.-мүшесі (Қазақстан)  
**Бисенбаев А.К.** проф., корр.-мүшесі (Қазақстан)  
**Бишимбаева Н.К.** проф., корр.-мүшесі (Қазақстан)  
**Ботабекова Т.К.** проф., корр.-мүшесі (Қазақстан)  
**Ellenbogen Adrian** prof. (Tel-Aviv, Israel),  
**Жамбакин К.Ж.** проф., корр.-мүшесі (Қазақстан), бас ред. орынбасары  
**Ishchenko Alexander**, prof. (Villejuif, France)  
**Қайдарова Д.Р.** проф., корр.-мүшесі (Қазақстан)  
**Күзденбаева Р.С.** проф., академик (Қазақстан)  
**Лось Д.А.** prof. (Мәскеу, Ресей)  
**Lunefeld Bruno** prof. (Израиль)  
**Миербеков Е.М.** проф. (Қазақстан)  
**Муминов Т.А.** проф., академик (Қазақстан)  
**Purton Saul** prof. (London, UK)  
**Рахыпбеков Т.К.** проф., корр.-мүшесі (Қазақстан)  
**Сапарбаев Мұрат** проф. (Париж, Франция)  
**Сарбассов Дос** проф. (Хьюстон, АҚШ)

«ҚР ҰҒА Хабарлары. Биология және медициналық сериясы».

**ISSN 2518-1629 (Online),**

**ISSN 2224-5308 (Print)**

Меншіктенуші: «Қазақстан Республикасының Ұлттық ғылым академиясы» РҚБ (Алматы қ.)

Қазақстан республикасының Мәдениет пен ақпарат министрлігінің Ақпарат және мұрағат комитетінде  
01.06.2006 ж. берілген №5546-Ж мерзімдік басылым тіркеуіне қойылу туралы куәлік

Мерзімділігі: жылына 6 рет.

Тиражы: 300 дана.

Редакцияның мекенжайы: 050010, Алматы қ., Шевченко көш., 28, 219 бөл., 220, тел.: 272-13-19, 272-13-18,  
[www.nauka-nanrk.kz](http://www.nauka-nanrk.kz) / [biological-medical.kz](http://biological-medical.kz)

---

© Қазақстан Республикасының Ұлттық ғылым академиясы, 2017

Типографияның мекенжайы: «Аруна» ЖК, Алматы қ., Муратбаева көш., 75.

Г л а в н ы й р е д а к т о р  
академик НАН РК, д.м.н., проф.

**Ж. А. Арзыкулов**

**Абжанов Архат** проф. (Бостон, США),  
**Абелев С.К.** проф. (Москва, Россия),  
**Айтхожина Н.А.** проф., академик (Казахстан)  
**Акшулаков С.К.** проф., чл.-корр. (Казахстан)  
**Алчинбаев М.К.** проф., чл.-корр. (Казахстан)  
**Березин В.Э.**, проф., чл.-корр. (Казахстан)  
**Бисенбаев А.К.** проф., чл.-корр. (Казахстан)  
**Бишимбаева Н.К.** проф., чл.-корр. (Казахстан)  
**Ботабекова Т.К.** проф., чл.-корр. (Казахстан)  
**Ellenbogen Adrian** prof. (Tel-Aviv, Israel),  
**Жамбакин К.Ж.** проф., чл.-корр. (Казахстан), зам. гл. ред.  
**Ishchenko Alexander** prof. (Villejuif, France)  
**Кайдарова Д.Р.** проф., чл.-корр. (Казахстан)  
**Кузденбаева Р.С.** проф., академик (Казахстан)  
**Лось Д.А.** prof. (Москва, Россия)  
**Lunenfeld Bruno** prof. (Израиль)  
**Миербеков Е.М.** проф. (Казахстан)  
**Муминов Т.А.** проф., академик (Казахстан)  
**Purton Saul** prof. (London, UK)  
**Рахыпбеков Т.К.** проф., чл.-корр. (Казахстан)  
**Сапарбаев Мурат** проф. (Париж, Франция)  
**Сарбассов Дос** проф. (Хьюстон, США)

«Известия НАН РК. Серия биологическая и медицинская».

**ISSN 2518-1629 (Online),**

**ISSN 2224-5308 (Print)**

Собственник: РОО «Национальная академия наук Республики Казахстан» (г. Алматы)

Свидетельство о постановке на учет периодического печатного издания в Комитете информации и архивов  
Министерства культуры и информации Республики Казахстан №5546-Ж, выданное 01.06.2006 г.

Периодичность: 6 раз в год

Тираж: 300 экземпляров

Адрес редакции: 050010, г. Алматы, ул. Шевченко, 28, ком. 219, 220, тел. 272-13-19, 272-13-18,  
[www.nauka-nanrk.kz/biological-medical.kz](http://www.nauka-nanrk.kz/biological-medical.kz)

---

© Национальная академия наук Республики Казахстан, 2017

Адрес типографии: ИП «Аруна», г. Алматы, ул. Муратбаева, 75

Editor in chief

academician of NAS RK, doctor of medical science, professor

**Zh. A. Arzykulov**

**Abzhanov Arkhat** prof. (Boston, USA),  
**Abelev S.K.** prof. (Moscow, Russia),  
**Aitkhozhina N.A.** prof., academician (Kazakhstan)  
**Akshulakov S.K.** prof., corr. member. (Kazakhstan)  
**Alchinbayev M.K.** prof., corr. member. (Kazakhstan)  
**Berezin V.Ye.**, prof., corr. member. (Kazakhstan)  
**Bisenbayev A.K.** prof., corr. member. (Kazakhstan)  
**Bishimbayeva N.K.** prof., corr. member. (Kazakhstan)  
**Botabekova T.K.** prof., corr. member. (Kazakhstan)  
**Ellenbogen Adrian** prof. (Tel-Aviv, Israel),  
**Zhambakin K.Zh.** prof., corr. member. (Kazakhstan), deputy editor in chief  
**Ishchenko Alexander**, prof. (Villejuif, France)  
**Kaydarova D.R.** prof., corr. member. (Kazakhstan)  
**Kuzdenbayeva R.S.** prof., academician (Kazakhstan)  
**Los D.A.** prof. (Moscow, Russia)  
**Lunefeld Bruno** prof. (Israel)  
**Miyerbekov Ye.M.** prof. (Kazakhstan)  
**Muminov T.A.** prof., academician (Kazakhstan)  
**Purton Saul** prof. (London, UK)  
**Rakhypbekov T.K.** prof., corr. member. (Kazakhstan)  
**Saparbayev Murat** prof. (Paris, France)  
**Sarbassov Dos**, prof. (Houston, USA)

**News of the National Academy of Sciences of the Republic of Kazakhstan. Series of biology and medicine.**

**ISSN 2518-1629 (Online),**

**ISSN 2224-5308 (Print)**

Owner: RPA "National Academy of Sciences of the Republic of Kazakhstan" (Almaty)

The certificate of registration of a periodic printed publication in the Committee of information and archives of the Ministry of culture and information of the Republic of Kazakhstan N 5546-Ж, issued 01.06.2006

Periodicity: 6 times a year

Circulation: 300 copies

Editorial address: 28, Shevchenko str., of. 219, 220, Almaty, 050010, tel. 272-13-19, 272-13-18,

<http://nauka-nanrk.kz/biological-medical.kz>

---

© National Academy of Sciences of the Republic of Kazakhstan, 2017

Address of printing house: ST "Aruna", 75, Muratbayev str, Almaty

## NEWS

OF THE NATIONAL ACADEMY OF SCIENCES OF THE REPUBLIC OF KAZAKHSTAN

SERIES OF BIOLOGICAL AND MEDICAL

ISSN 2224-5308

Volume 1, Number 319 (2017), 203 – 207

UDC 541.128

**Zh. K. Ibraimova, R. E. Aitkulova, D. E. Kudasova, A. A. Ospanova, Zh. N. Baimirzayeva**

South Kazakhstan State University M. Auezov, Shymkent, Kazakhstan.

E-mail: dariha\_uko@mail.ru

**STUDYING THE INFLUENCE OF COMBINED SILOS  
ON COW'S MILK PRODUCTION**

**Abstract.** In order to preserve the nutritional value of herbs, 4 options of combined silos have been designed: option I (reference) - maize, option II (experimental) - maize (70%), Sudan grass (30%), option III (experimental) - maize (70%), alfalfa (30%) and option IV (experimental) - maize (60%), Sudan grass (20%), and alfalfa (20%). Options II-IV of combined silage contained lactic -acid bacterium *Lactobacillus plantarum-52* at the rate of 1 billion cells per kg of green mass. Study of the combined silos chemical composition 120 days later showed that in the experimental options, as compared to the reference one, protein content was higher (II - 11.4%. III - 12.2%. IV - 12.91%) and, conversely, fiber content was decreased. Feeding cows with combined silage that contains probiotics has a positive effect on their milk production. Within 100 days of the experiment, cows in experimental groups gave milk more by 60-230 kg.

**Keywords:** combined silage, cow, *Lactobacillus plantarum-52* culture, milkiness, maize, Sudan grass, alfalfa, milk, fat.

**Introduction.** According to the data from Donaldson E. [1], Luck E. [2], Wiegmann C. [3], Spoelstra S.F. et. Al. [4], increasing attention in foreign countries is paid to combined silos obtained with the use of various bacteria, which improve the quality of ensilaged cultures to a certain extent.

At the same time, many of the bacteria used proved to be unsuitable for hardly ensilaged grass, particularly legumes. Inefficiency of preparations based on osmotolerant lactic-acid bacteria in ensilaging high-protein legumes can be explained by the lack of sugar required for formation of a sufficient amount of organic acids.

Various preparations and biological preservatives have been used for ensilaging hardly ensilaged herbs [5, 6]. In recent years, works appeared that evidence a positive solution to the problem of ensilaging high protein legumes with the use of the *Lactobacillus plantarum-52* lactic acid bacterium [7-9]. According to G. Y. Laptev [10] and V. A. Ramensky [11], *Lactobacillus plantarum-52* is suitable for preserving nutrients and for improving quality of grass silage of virtually any plant material. Besides, *Lactobacillus plantarum-52* possesses antibacterial properties together with well expressed fungicidal abilities, as well.

The purpose of the research was to develop combined silage in the Southern region of Kazakhstan, using the *Lactobacillus plantarum-52* culture, from a variety of forage crops, including legumes, that stably maintains nutritional assets of freshly cut grass and, when subsequent used for feeding lactating cows, contribute to increased milk production.

**Materials and methods of research.** The research was carried out in the laboratories of the South-Kazakhstan State University named after M. Auezov and in production conditions in accordance with "Guidelines for studying preservative effects of chemicals used in silages in the laboratory" [12]. The study of combined silage influence on dairy cows was made using Auliatinsk breed. The digital material obtained from the studies was mathematically processed by N. A. Plokhinsky [13].

**Main part.** In laying silage, the following crops were used: maize, Sudan grass and alfalfa. These crops were used for laying 4 kinds of silage. Silage of option I (reference) consists of maize, option II

(experimental) - of maize (70%) and Sudan grass (30%), option III (experimental) - of maize (70%) and alfalfa (30%), and option IV (experimental) - of maize (60%), Sudan grass (20%), and alfalfa (20%). Experimental options of combined silage contain lactic-acid bacterium *Lactobacillus plantarum-52*.

Green plants were ensilaged using containers (1 dm<sup>3</sup>) with 4 repetitions of each option. Freshly mowed green mass was milled and chemically analyzed in a laboratory for 24 hours. 10 ml of preservatives diluted in water at the ratio of 1:1 were added to 1 kg of freshly mowed mass. After introducing bacterial cultures, raw materials were mixed and loaded into a laboratory container rammed to profuse juice discharge from the silage mass.

The containers were weighed, capped, sealed with paraffin and stacked for storage in an unlit, dry and cool room. The silages were allowed to ripen for 120 days, then they were evaluated by organoleptic characteristics, their acidity was determined, and the content of solids was analyzed.

The results of silos chemical analysis showed (table 1) that complex silage with probiotics (groups 2 through 4) features a higher content of nutrients, as compared to maize silage. Thus, the amount of dry matter in silage of maize, Sudan grass and alfalfa was 29.36%, or by 1.60% higher, as compared to option I ( $P < 0.01$ ). Content of dry matter in option IV is also higher than in option II by 2.02% ( $P < 0.05$ ), and in option III by 2.82%. Content of crude protein was also significantly higher in silage of option IV. At the same time, crude fat content in the compared silages containing *Lactobacillus plantarum-52* (Groups 2-4) is virtually the same (4.7-4.8%). By this indicator, the experimental groups outperform the reference group by 1.4 to 1.5%. The highest content of crude fibre was seen in the reference option of silage - 7.67%, in the option with Sudan grass and alfalfa, fibre content is less by 0.46%, and in the maize and alfalfa option- by 0.89%. Acidity of the reference and experimental options of complex silages was 3.8 to 3.9.

Table 1 – Characteristics of the compared combined silages by chemical composition

Indicators	Maize silage	Complex silage (70% maize + 30% Sudan grass+ <i>Lactobacillus plantarum-52</i> )	Complex silage (70% maize + 30% alfalfa+ <i>Lactobacillus plantarum-52</i> )	Complex silage (60% maize + 20% Sudan grass + 20% alfalfa + <i>Lactobacillus plantarum-52</i> )
	I (reference)	II (experimental)	III (experimental)	IV (experimental)
Dry matter,% including:	27.76±1.2	26.34±0.97	26.54±0.93	29.36±0.68
Protein, %	9.52 ±0.01	11.61±0.08	12.18±0.3 7*	12.91±0.78*
Fat, %	3.49 ± 0.02	4.14 ±0.03*	4.83 ±0.05**	4.86 ±0.06**
Fibre,%	37.03 ±1.04	35.93± 0.92*	32.34 ± 1.31**	30.82 ± 1.74**
Ash, %	1.97±0.15	1.89±0.13	1.92±0.13	1.96±0.17
Nitrogen-free extractive substances %	47.99± 1.74	46.43 ±2.14	48.73 ±2.76	49.45 ±1.43
pH	3.8 ±0.03	3.9 ±0.04	3.9 ±0.08	3.9 ±0.07
Acids ratio, %				
lactic	71.7 ±2.08	79.6±2.47	80.5±2.11	81.1±2.43
acetic	28.3±0.7	20.4±2.36	19.5±3.21	18.9±1.62
oleic	0.0	0.0	0.0	0.0
Carotene, mg/kg	19.40±1.84	22.42	26.7 ±2.42	29.8 ±2.19
Forage units in 1kg of natural forage	0.19±0.007**	0.22±0.005	0.23±0.006	0.24±0.008
* p < 0.05; ** -p < 0.01.				

An equally important quality characteristic of the harvested silages is preservation of nutrients (Table 2). Results in Table 2 show that the maize & alfalfa & Sudan grass option (IV experimental) is the best in preserving dry matter (87.89%), organic matter (86.78%), protein (92.51%), ash (85.96 %), nitrogen-free extractives (78.49%) and carotene (65.71%).Fibre is best preserved in maize silage (83,72%).

Table 2 – Preservation of nutrients in silages (% of initial weight)

Indicators	Maize silage	Complex silage (70% maize + 30% Sudan grass + <i>Lactobacillus plantarum</i> -52)	Complex silage (70% maize + 30% alfalfa + <i>Lactobacillus plantarum</i> -52)	Complex silage (60% maize + 20% Sudan grass + 20% alfalfa + <i>Lactobacillus plantarum</i> -52)
Dry matter	81.32±2.53	82.87±2.69	82.72±2.59	87.89±2.49*
Organic matter	81.21±2.67	85.62±3.83	85.92±3.27	86.78±2.12
Protein	85.23±1.98	86.63±3.02	87.54±3.05	92.51±2.32*
Fibre	93.26±2.64	83.28±3.34	83.84±3.57	83.72±2.91
Ash	81.92±3.62	83.87±3.51	85.92±2.78	85.96±2.89
Nitrogen-free extractive substances	74.99±2.39	75.73±3.12	76.43±3.41	78.49±2.83
Carotene, mg/kg	52.29±5.29	61.44±2.02	61.72±1.56	65.71±1.89
Forage units	82.61±1.45	84.64±3.51	85.81±3.38	94.37±2.29*

Based on the above data about qualitative and quantitative composition of ready silages, it can be stated that *Lactobacillus plantarum*-52 is suitable for the preservation of green mass of cereals and legumes. In all options, studies with the use of probiotics gave results superior to mono-component silage. It was established that combined silages containing maize, Sudan grass and alfalfa with probiotic added feature the least loss of nutrients. Especially, silaged grass proteins were preserved in sufficient quantities (86.63 to 92.51%). Cereals mixed with legumes and lactic acid bacterium *Lactobacillus plantarum*-52 make a silage with good organoleptic characteristics, high degree of preservation of dry and organic substances, and less loss of carotene of observed during storage.

Feeding complex silage made of maize, Sudan grass and alfalfa to lactating cows results in increased milk production by animals (Table 3). Introduction of silages of maize and Sudan grass with probiotic (II experimental) increases milk production by 8.6% in comparison with maize silage. A similar 11.3% increase in cows' milk yield was found in case of feeding them with maize and alfalfa silage with probiotic. Milk productivity in cows that received combined silage (group IV) consisting of: maize (60%), Sudan grass (20%) and alfalfa (20%) with *Lactobacillus plantarum*-52 was higher than that in other groups. Milk production in cows of the fourth group was higher by 17.9% than that in the reference group, and by 8.6% higher than that in the second group, and by 4.4% higher than the one in the third group. Eatability by cows of the silage from group I was 90.2%, from groups II and III - 92.6%. The best combined silage eatability was found in cows in group IV- 94.3%.

Table 3 – Influence of combined silages on cows' milk production

Indicators	I reference (no preservative)	Combined silage with <i>Lactobacillus plantarum</i> -52 lactic-acid bacterium		
		II experimental	III experimental	IV experimental
Daily milk yield, kg	13.9±0.84	15.1±0.71	15.7±0.76	16.4±0.83
Milk fat, %	3.83±0.06	3.93±0.09	3.91±0.07	3.90±0.08
Obtained in 100 days of experiment: milk	1390.0±62.2	1510.0±49.2	1570.0±53.6	1640.0±67.4
Milk fat	53.2±1.51	55.4±1.59	61.3±2.04	63.9±1.84

The study of the qualitative composition of milk from experimental cows showed that they were practically identical in chemical composition and technological properties at the beginning of the experiment. However, after 100 days of receiving combined silage with lactic-acid ferment (*Lactobacillus plantarum*-52), improvement in milk quality indicators in all experimental groups was found.

Thus, a positive effect of the combined silos on cows' milkiness and content of essential nutrients in milk was found in the experiment. These data speak for potential use of *Lactobacillus plantarum*-52 for ensilaging hardly ensilaged crops, and the use of these combined silages for feeding cows in order to increase their milk production.

**Discussion.** The obtained experimental results show the possibility of ensilaging hardly ensilaged alfalfa with the *Lactobacillus plantarum-52* preservative that has antibacterial properties and fungicidal action and is present in maize and Sudan grass. Bactericidal properties of *Lactobacillus plantarum-52* were first reported by A. Polnomochnov et al., [14, 15] who suggested using this culture in the production of antibiotics. More detailed studies of morphological, cultural, and biological properties of *Lactobacillus plantarum-52* was performed by N. P. Tarabukina [16], which became the basis for developing the possibility of using herbs for preserving animal forage [17, 18]. V. Duborezov, V. Vinogradov [19] studied cellular features of *Lactobacillus plantarum-52* in detail and characterized their zymoplastic features. Our research has shown that silage combined with *Lactobacillus plantarum-52* by its protein and fat content exceeds the reference group and has a positive effect on cows' milkiness, which also confirms previous findings of some authors [20].

### Conclusions.

1. The studies have shown high preservative activity of the *Lactobacillus plantarum-52* strain in ensilaging legumes and cereals. In combined silages containing this probiotic, protein and fat content increases, and fibre content decreases.

2. Feeding combined silage with the *Lactobacillus plantarum-52* strain to lactating cows results in an increase in milkiness by 11.3% -17.9%, and an increase in protein content by 3.32%.

### REFERENCES

- [1] Donaldson E. Getting the right silage // Machinery for silage. Hurley, 1985. P. 12-17.
- [2] Luck E. Chemische Lebensmittelkonservierung. Berlin, Heidelberg, New York, Tokyo, 1995. P. 225.
- [3] Wiegmann S. Konservierung von Herbstgrasern mit einem Silierzusatz aus Lactobakterien. Diplomarbeit an der Technischen Universität. Berlin, 1996. P. 95.
- [4] Spoelstra S.F., Courtin M.G., Beers J.A.C. Acetic acid bacteria can initiate aerobic deterioration of whole crop maize silage // J. of Agr. Sci. 1988. N 1. P. 127-132.
- [5] Levahin V.I. Ispol'zovanie konservantov pri silosovanii kormov. Kazan', 2001. 291 p.
- [6] Pobednov Ju.A., Hudokormov V.V. Novyj preparat dlja silosovanija provjalennyh trav // Kormoproizvodstvo. 2000. N 6. P. 30-31.
- [7] Pobednov J.A. Effect of the bacterium *Bacillus subtilis* on the safety and quality of dried grass silage. 2001. N 11. P. 29-32.
- [8] Mamaev A.A. Efficacy preserving herbs culture *Bacillus subtilis* and use of the resulting feed ration cattle: Author. diss. k.s.h.n. 2005.
- [9] Kostin D.N. Meat efficiency of calves when used in canned rations of alfalfa silage. M.: Kolos, 2008. P. 113.
- [10] Laptsev G.Ju. Biotrof mikrobiologija dlja zhivotnovodstva // Sel'skohozjajstvennye vesti. 2003. N 1. P. 10.
- [11] Ramenskij V.A. Sravnitel'naja charakteristika bakterial'nyh zakvasok i himicheskikh konservantov pri silosovanii trav: Dis. kand. s.-h. nauk: 06.02.02. M., 1991. 205 p.
- [12] Guidelines for the study in the laboratory preservative effects of chemicals used in the silage ( AUIAB ) Dubrovicy, 1993. 9 p.
- [13] Plohinsky H.A. Rukovodstvo biometrics for Animal Husbandry. M.: Kolos, 1969. 25 p.
- [14] Polnomochnov A. Zagotovka silosa s biologicheskim konservantom // Zhivotnovodstvo Rossii. 2001. N 6. P. 36-37.
- [15] Panov A.A. Razrabotka i sovershenstvovanie tehnologij silosovanija zelenoj massy kormovyh kul'tur s ispol'zovaniem himicheskikh i biologicheskikh preparatov: Avtoref. dis. dokt. s.-h. nauk: 06.02.02. M., 1998. 38 p.
- [16] Tarabukina N.P. Morphological, cultural, and biological properties of *Bacillus subtilis* «TNT-3.» // Scientific support veterinary problems in livestock: Sat scientific. tr. Novosibirsk, 2000. P. 264-266.
- [17] Allaberdin I.L. Nauchnye i prakticheskie osnovy primeneniya himicheskikh, biologicheskikh i rastitel'nyh konservantov pri zagotovke silosa i ispol'zovanija ego v kormlenii krupnogo rogatogo skota: Avtoref. dokt. diss. Orenburg, 1999. 46 p.
- [18] Hudokormov B.B. Jefferktivnost' konservirovanija provjalennyh trav preparatom Biotrofi- ispol'zovanie poluchennogo korma v racionah krupnogo rogatogo skota: Avtoref. dis. kand. s.-h. nauk: 06.02.02. M., 2002. 16 p.
- [19] Duborezov V., Vinogradov V. Biokonservanty povyshajut pitatel'nost' kormov // Zhivotnovodstvo Rossii. 2004. N 5. 1. P. 9.
- [20] Bezborodov I.N. Polnocennoe kormlenie krupnogo rogatogo skota. Belgorod: Izd-vo BGSHA, 2001. 35 p.



**Ж. К. Ибраимова, Р. Э. Айткулова, Д. Е. Кудасова, А. А. Оспанова, Ж. Н. Баймирзаева**

М. Әуезов атындағы ОҚМУ, Шымкент, Қазақстан

### **СЫРЛАРДЫҢ СҮТ ӨНІМДІЛІГІНЕ ЖИЫНТЫҚ ТҮРІНДЕГІ СҮРЛЕМНІҢ ӘСЕРІН ЗЕРТТЕУ**

**Аннотация.** Шөптердің қоректік құндылығын сақтау мақсатында жиынтық түріндегі сүрлемнің 4 нұсқасы жасалды. Жиынтық түріндегі сүрлемнің I нұсқасының (бақылаудағы) құрамы – жүгері сүрлемі, II нұсқа (сынақтық) - жүгері (70%), судан шөбі (30%), III нұсқа (сынақтық) – жүгері (70%), люцерна (30%) және IV нұсқа (сынақтық) – жүгері (60%), судан шөбі (20%), люцерна (20%). Жиынтық түріндегі сүрлемнің II-IV нұсқаларына *Lactobacillus plantarum*-52 сүт қышқылды бактериялар қосылды. Жиынтық түріндегі сүрлемнің 120 күн өткен соң химиялық құрамын зерттеу көрсеткендей, сынақтық нұсқаларда протеин құрамы жоғары (II - 11,4%, III - 12,2%, IV - 12,91%) және керісінше клетчатка құрамының деңгейі төмендейді. II, III, IV нұсқаларда сиырларды жиынтық түріндегі сүрлеммен азықтандыру олардың сүттілік өнімділігіне оң әсер етеді. 100 күндік сынақ жүргізу кезінде осы топтардағы сиырлардан көп мөлшерде сүт (60-230 кг) және май (5,7-12,7 кг).

**Түйін сөздер:** жиынтық түріндегі сүрлем, сиырлар, *Lactobacillus plantarum* -52 культураны, сүттілігі, жүгері, судан шөбі, люцерна, сүт, май.

**Ж. К. Ибраимова, Р. Э. Айткулова, Д. Е. Кудасова, А. А. Оспанова, Ж. Н. Баймирзаева**

Южно-Казахстанский государственный университет им. М. Ауэзова, Шымкент, Казахстан

### **ИССЛЕДОВАНИЕ ВЛИЯНИЕ КОМБИНИРОВАННОГО СИЛОСА НА МОЛОЧНУЮ ПРОДУКТИВНОСТЬ КОРОВ**

**Аннотация.** С целью сохранения питательную ценность трав разработаны 4 варианта комбинированных силосов. I вариант (контрольная) комбинированного силоса включает кукурузный силос, II вариант (опытная) - кукурузы (70%), суданская трава (30%), III вариант (опытная) - кукурузы (70%), люцерны (30%) и IV вариант (опытная) - кукуруза (60%), суданская трава (20%), люцерна (20%). Во II-IV варианты комбинированного силоса добавлены молочнокислой бактерий *Lactobacillus plantarum*-52. Исследования через 120 дней химического состава комбинированных силосов показали, что в опытных вариантах более высокое содержание протеина (II - 11,4%, III - 12,2%, IV - 12,91%) и наоборот снижены уровня содержания клетчатки. Скармливание коров комбинированным силосом II, III, IV вариантов положительно влияют на их молочную продуктивность. За 100 опытных дней от коров этих групп получено больше молока (60-230 кг) и жира (5,7-12,7 кг).

**Ключевые слова:** комбинированный силос, коровы, культура *Lactobacillus plantarum* -52, молочность, кукуруза, суданская трава, люцерна, молоко, жир.

#### **Сведения об авторах:**

Ибраимова Жулдыз Кайратовна – преподаватель, доктор PhD, Южно-Казахстанский государственный университет им. М. Ауэзова, Высшая школа «Химическая инженерия и Биотехнология», кафедра «Биотехнология».

Айткулова Райхан Алтайбековна – кандидат химических наук, доцент, Южно-Казахстанский государственный университет им. М. Ауэзова, Высшая школа «Химическая инженерия и Биотехнология», кафедра «Биотехнология»

Кудасова Дариха Ерадиловна - магистр, преподаватель, Южно-Казахстанский государственный университет им. М. Ауэзова, Высшая школа «Химическая инженерия и Биотехнология», кафедра «Биотехнология».

Оспанова Айкерим Абдрахмановна - старший преподаватель, Южно-Казахстанский государственный университет им. М. Ауэзова, Высшая школа «Химическая инженерия и Биотехнология», кафедра «Биотехнология»

Баймирзаева Жамила Нуралиевна – магистр, преподаватель, Южно-Казахстанский государственный университет им. М. Ауэзова, Высшая школа «Химическая инженерия и Биотехнология», кафедра «Биотехнология».

## **Publication Ethics and Publication Malpractice in the journals of the National Academy of Sciences of the Republic of Kazakhstan**

For information on Ethics in publishing and Ethical guidelines for journal publication see <http://www.elsevier.com/publishingethics> and <http://www.elsevier.com/journal-authors/ethics>.

Submission of an article to the National Academy of Sciences of the Republic of Kazakhstan implies that the described work has not been published previously (except in the form of an abstract or as part of a published lecture or academic thesis or as an electronic preprint, see <http://www.elsevier.com/postingpolicy>), that it is not under consideration for publication elsewhere, that its publication is approved by all authors and tacitly or explicitly by the responsible authorities where the work was carried out, and that, if accepted, it will not be published elsewhere in the same form, in English or in any other language, including electronically without the written consent of the copyright-holder. In particular, translations into English of papers already published in another language are not accepted.

No other forms of scientific misconduct are allowed, such as plagiarism, falsification, fraudulent data, incorrect interpretation of other works, incorrect citations, etc. The National Academy of Sciences of the Republic of Kazakhstan follows the Code of Conduct of the Committee on Publication Ethics (COPE), and follows the COPE Flowcharts for Resolving Cases of Suspected Misconduct ([http://publicationethics.org/files/u2/New\\_Code.pdf](http://publicationethics.org/files/u2/New_Code.pdf)). To verify originality, your article may be checked by the Cross Check originality detection service <http://www.elsevier.com/editors/plagdetect>.

The authors are obliged to participate in peer review process and be ready to provide corrections, clarifications, retractions and apologies when needed. All authors of a paper should have significantly contributed to the research.

The reviewers should provide objective judgments and should point out relevant published works which are not yet cited. Reviewed articles should be treated confidentially. The reviewers will be chosen in such a way that there is no conflict of interests with respect to the research, the authors and/or the research funders.

The editors have complete responsibility and authority to reject or accept a paper, and they will only accept a paper when reasonably certain. They will preserve anonymity of reviewers and promote publication of corrections, clarifications, retractions and apologies when needed. The acceptance of a paper automatically implies the copyright transfer to the National Academy of Sciences of the Republic of Kazakhstan.

The Editorial Board of the National Academy of Sciences of the Republic of Kazakhstan will monitor and safeguard publishing ethics.

Правила оформления статьи для публикации в журнале смотреть на сайте:

[www.nauka-nanrk.kz](http://www.nauka-nanrk.kz)

**ISSN 2518-1629 (Online), ISSN 2224-5308 (Print)**

<http://www.biological-medical.kz/index.php/ru/>

Редактор *М. С. Ахметова, Д. С. Аленов, Т. М. Апендиев*  
Верстка на компьютере *Д. Н. Калкабековой*

Подписано в печать 20.03.2017.  
Формат 60x881/8. Бумага офсетная. Печать – ризограф.  
14,0 п.л. Тираж 300. Заказ 1.